



# Predictors of College Students' Use of Complementary and Alternative Medicine

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## ABSTRACT

*This study assessed the use of complementary and alternative medicine among college students (N=913), the relationships between health locus of control with use of complementary and alternative medicine, and health locus of control with attitudes toward complementary and alternative medicine and what predicts their use. A majority (66%, n=913) of students reported using complementary and alternative medicine, with higher use found among older students ( $p=.006$ ) and female students ( $p=.01$ ). Holistic attitude and control were strong predictors for college students use of complementary and alternative medicine, and there was a significant correlation between internal locus of control and the use of complementary and alternative medicine ( $r=.35$ ,  $p=.01$ ). College students were more likely to use complementary and alternative medicine when compared with samples from other studies. Campus health care providers and college curriculum planners may need to include complementary and alternative medicine services and education to help students maintain health and wellness.*

The National Center for Complementary and Alternative Medicine (NCCAM) was established (P.L. 105-227, 11 Stat. 2681) in 1998 to facilitate and conduct research on alternative medical treatments due to a growing need and interest in these forms of therapy. Although traditional medical procedures are generally regarded as preferred among allopathic doctors (MD), osteopathic doctors (DO), and others who hold degrees in allied health disciplines granted by Western universities, complementary and alternative medicine (CAM) consist of therapies outside this convention. Because there is such a variety of nontraditional medical practice and treatment, the

NCAAM developed specific definitions for these remedies to distinguish them from traditional medicine. The NCCAM identifies *complementary medicine* as therapy used with conventional medical treatment, whereas *alternative medicine* is therapy used in place of conventional medicine. There are five categories of CAM: (1) alternative medical systems (homeopathic and naturopathic medicine); (2) mind-body interventions (meditation, prayer, dance, art and music therapies); (3) biologically based therapies (botanical remedies, foods, and vitamins); (4) manipulative and body-based methods (chiropractic or osteopathic manipulation and massage); and (5) energy

therapies (*chi gong*, *reiki*, therapeutic touch, and therapies using electromagnetic fields) (see <http://altmed.od.nih.gov/health/whatiscam/>).

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The use of CAM among consumers and patients (Del Mundo, Shepard, & Macrose, 2002; Eisenberg et al. 1998; Elder, Gillcrist, & Minz, 1997; Palinkas & Kabongo, 2000) ranges from 35% of the general population in Eisenberg's (1998) study to 21–50% of patients at family practice offices (Elder et al. 1997; Del Mundo et al. 2002; and Palinkas et al. 2000) using some form of CAM therapies. Almost half of the patients in these studies did not discuss their CAM use with their physicians.

What motivates individuals to use CAM is yet to be established. Pettelier, Marie, Krasner, and Haskell (1997) identified eight different reasons for increased consumer use of CAM, including dissatisfaction with conventional medicine, perception that conventional medicine does not include their spiritual and mental well-being, greater awareness of medical practices of other cultures, and greater availability of information that link lifestyle, emotional, and nutritional factors to disease. But Astin (1998) found that dissatisfaction with conventional medicine did not predict the use of CAM. Instead, the congruency of beliefs, values, and philosophical issues were found to be more important issues for subjects in choosing to use CAM. Astin (1998) also found that educated persons were more likely to use CAM than were those with less education.

College students are a unique population who are likely to use CAM. First, they have more education than their high school peers who did not go on to college. Second, they are in learning environments that present them with myriads of information while they are often faced with having to make decisions of self-care for the first time, independent of their parents. Patterson and Graf (2000) presented a strong argument to integrate CAM into the college-level health education curriculum to educate students about CAM and to help them better serve their clients when they become health professionals.

This study proposed to determine (1) to what extent college students use CAM, (2) what attitudes college students have toward

the use of CAM, (3) the relationship between students' health locus of control and their attitudes toward the use of alternative medicine, (4) the relationship between students' health locus of control and their use of CAM, and (5) what factors predict college students' use of CAM.

## SIGNIFICANCE

Understanding how much college students use CAM, how students feel toward CAM, and the predictors of college students use of CAM will be helpful in planning student health services on campus to better serve students. Having this understanding also helps establish the need for health services providers on campus to expand their knowledge of CAM to help avoid negative drug and CAM interactions, and also to educate their patients. Further, this knowledge could be used to provide an argument for offering courses on CAM to help students toward self-care.

## METHOD

### *Sample and Procedures*

The sample was drawn from students at the University of North Texas (UNT), a campus with approximately 30,000 undergraduate and graduate students. Approval was obtained from the Institutional Review Board of UNT and informed consent protocol was appropriately applied.

Students enrolled in different classes across disciplines from summer through fall semesters were asked to respond. They were instructed not to repeat the surveys if they had previously responded. A total of 940 questionnaires were distributed.

### *Measures*

The independent variables were gender, class level, CAM use (CAMU), attitudes toward alternative medicine (ATAM), and multidimensional health locus of control (MHLC). The dependent variables were CAMU, ATAM, and MHLC. Independent and dependent variables were employed appropriately according to analytical procedures in response to individual research question.

A 51-item instrument was developed for the study. The items in the subscales were selected after test-retest reliability was established. The instrument consisted of (1) the ATAM scale (22 items); (2) MHLC scale (18 items); (3) CAMU scale (7 items); and (4) demographic data (4 items). The ATAM subscales were safety (10 items,  $\alpha=0.88$ , test-retest reliability=0.82); holistic attitude and control (8 items,  $\alpha=0.83$ , test-retest reliability=0.65); and dissatisfaction (4 items,  $\alpha=0.76$ , test-retest reliability=0.74). The MHLC subscales were internal health locus of control (IHLC) [6 items,  $\alpha=0.66$ , test-retest reliability=0.72]; chance locus of control (CHLC) [6 items,  $\alpha=0.63$ , test-retest reliability=0.70]; and powerful others health locus of control (PHLC) [6 items,  $\alpha=0.65$ , test-retest reliability=0.73]. Seven items of CAMU requiring yes/no responses, and four demographic questions were added to the ATAM and MHLC to complete the 51-item instrument.

CAMU measures to what extent college students used CAM in the past 12 months. Use included meditation/relaxation; massage; yoga; herbal therapies; high-dose vitamins and nutritional supplements; acupuncture; and chiropractic medicine. The ATAM measures attitudes toward CAMU along three dimensions: holistic attitude and control, dissatisfaction with modern/western medicine, and safety. The MHLC (Wallston, Wallston & DeVellis, 1978) measures IHLC, PHLC, and CHLC. IHLC is the belief that the individual has the ability to influence his/her health. PHLC is the belief that one's health is determined by powerful others, such as doctors or health care professionals. CHLC measures the extent to which health or illness is a matter of fate, luck, or chance. The instrument also included demographic items asking for gender, age, class level, and ethnicity. All items except the demographic items used a 5-point Likert-type response format.

### *Data Analysis*

Descriptive and inferential statistics were used to analyze data collected. The SPSS (Statistical Package for the Social Sciences



Version 10, 1999) was used for all necessary computations. Level of statistical significance was set at  $p \leq .05$ .

## RESULTS

A total of 913 completed questionnaires were returned (97% response rate). The total sample ( $N=913$ ) consisted of undergraduates enrolled in core classes ( $n=684$ ), graduate students ( $n=229$ ), students using the Student Health and Wellness Center ( $n=48$ ), students from the University Union ( $n=9$ ), and members of student organizations ( $n=97$ ). The sample adequately represented the UNT student profiles (Table 1). The sample was 64% female, with no significant differences in age between genders. The respondents ranged in age from 18–62 years ( $M=24.73$ ,  $SD=6.25$ ).

### Extent of College Students CAMU

More than 66% ( $n=913$ ) of sample college students reported use of alternative medicine during the past year. Of this sample, 43% had used high-dose vitamin/nutritional supplements; 42% herbal medicine; 42% relaxation/meditation; 35% massage therapy; 18% chiropractic medicine; 12% yoga; and 5% acupuncture (Table 2). A chi-square test confirmed that females were more likely ( $\chi^2=6.237$ ;  $p=.01$ ) to report CAMU than males (odds ratio [OR]=1.4). Female students were more likely to use massage (OR=1.52;  $\chi^2=7.91$ ;  $p=.005$ ), yoga (OR=1.33;  $\chi^2=5.05$ ;  $p=.025$ ) and high-dose vitamin supplements (OR=1.38;  $\chi^2=5.31$ ;  $p=.025$ ). Graduate students were more likely to use CAM than undergraduates (OR=1.6;  $\chi^2=7.67$ ;  $p=.006$ ). Graduate students were more likely to use relaxation/meditation (OR=1.63;  $\chi^2=12.76$ ;  $p=.001$ ), and massage therapy (OR=1.7;  $\chi^2=6.44$ ;  $p=.01$ ).

### Attitudes of College Students Toward CAMU

Overall, students showed a slightly positive attitude toward CAM ( $M=3.13$ ,  $SD=0.51$  on a 5-point scale in which 5=strongly agree and 1=strongly disagree), more specifically, slightly positive on holistic attitude and control ( $M=3.45$ ,  $SD=0.58$ ),

Variable	Group	Sample (%)	UNT (%)
Gender	Male	36	45
	Female	64	55
Class level	Undergraduate	75	76
	Graduate	25	24
Ethnicity	Caucasian	72	72
	African American	9	9
	Hispanic/Latino	8	8
	Asian Pacific Islander	6	6

Alternative Medicine	Gender		Class Level	
	Female (%)	Male (%)	Undergrad (%)	Graduate (%)
High dose Vitamins/nutritional supplements	64.1	52.6	34.06	65.94
Herbal medicine	46.9	40.9	47.00	53.00
Relaxation/meditation	58.5	54.1	28.04	71.96
Massage therapy	52.7	40.1	40.09	59.91
Chiropractic medicine	17.9	5.8	77.11	22.89
Yoga	19.7	12.5	79.08	20.92
Acupuncture	4.6	5.8	91.02	8.98

Notes:  $N=585$  females and 328 males;  $N=683$  undergraduates and 230 graduates.

on safety ( $M=3.13$ ,  $SD=0.62$ ), and slight dissatisfaction with modern medicine ( $M=2.45$ ,  $SD=0.58$ ). There was no statistically significant difference on the ATAM overall summative mean scores between genders. Students did not report concern about safety issues ( $M=4.01$ ,  $SD=0.93$ ) or credibility of practitioners ( $M=3.68$ ,  $SD=0.99$ ) and believed that CAM professionals and modern Western medicine professionals should work together ( $M=4.17$ ,  $SD=0.90$ ).

### Health Locus of Control and Attitudes Toward and CAMU

A Pearson product-moment correlation coefficient revealed a statistically significant positive relationship between holistic attitude and control and IHLC ( $r=.35$ ,  $p=.01$ ).

Powerful others health locus of control PHLC was found to have a statistically significant negative correlation with IHLC ( $r=-.142$ ,  $p<.01$ ).

A Pearson product-moment correlation coefficient revealed statistically significant negative relationships between IHLC and the following subscales in CAMU: relaxation ( $r=-.176$ ,  $p=.01$ ); massage ( $r=-.096$ ,  $p=.01$ ); yoga ( $r=-.133$ ,  $p=.01$ ); herbs ( $r=-.147$ ,  $p=.01$ ); and vitamins ( $r=-.124$ ,  $p=.01$ ). Positive correlations were observed between CHLC and the following: relaxation ( $r=.173$ ,  $p=.01$ ) and massage ( $r=.068$ ,  $p=.05$ ). Positive correlations were also observed between PHLC and relaxation ( $r=.108$ ,  $p=.01$ ); yoga ( $r=.081$ ,  $p=.05$ ); and herbs ( $r=.118$ ,  $p=.01$ ).



### Predictive Factors of CAM

The first outcome of a stepwise logistic regression model revealed, holistic attitude and control (Wald=61.90,  $p=.01$ ) and safety (Wald=6.10,  $p=.01$ ) were significant predictors for CAMU. These two factors accounted for 18% of the variance. Although the second outcome of a stepwise logistic regression model confirmed that having an IHLC was a significant predictor of alternative medicine use (Wald=15.91,  $p=.001$ ), but it accounted for only 3% of variance.

A multivariate analysis of variance confirmed no gender differences among students on the MHLC. In reviewing differences between undergraduate and graduates on the MHLC, controlling for age, a multivariate analysis of covariance also found no significant differences.

### DISCUSSION

The study used self-reported data from student volunteers and therefore cannot be generalized to all college students. Self-reported data also present possible social biases. The sample was recruited from multiple sources on campus to match UNT's student profile.

Table 3 shows a comparison of this study with the reports from other studies. Students from this sample were more likely to use CAM than reported in other studies (66% reporting use in past year), 28% (Drivdahl & Miser, 1998), 42% (Eisenberg

et al. 1998), and 62% (Burg, Hatch, & Neims, 1998).

When so many students engage in self-care and CAM on campus, often without informing their physician at home or on campus, there is a potential risk of possible hazardous drug/therapeutic interactions. It is important for clinic staff and campus health educators to be aware of popular herbal and vitamin therapies so as to instruct students on their proper use and their limitations. Information about vitamins and herbal medicines could also be included on the health center Web page.

Consistent with previous studies (Astin, 1998; Eisenberg et al. 1998), females were more likely to use CAM. Also, no differences on rate of use among ethnic groups were found (Astin, 1998). In this sample, for every 100 graduate students reporting CAMU, 60 undergraduate students reported CAMU, which is consistent with Astin (1998) and Eisenberg et al. (1998), who suggested that age and education may be important factors in the decision to engage in practices of CAM. Astin (1998) indicated that the more education a person had, the more likely the person was knowledgeable about CAM. This was often through their own reading and study.

Students reported a positive attitude toward CAM. Having a holistic attitude and control was a primary predictor for CAMU. This was not surprising, because persons who use alternative medicine also

subscribe to concepts of holistic health and personal control, which is consistent with Astin (1998).

A desire to play an active role as a partner in health care decisions was found to be a predictor for CAMU. Although this sample reported that CAM provided them with this option, they saw no conflict with collaboration between the providers of modern Western medicine and CAM. Students who reported using CAM were neither dissatisfied with modern Western medicine, nor concerned about the safety of alternative medicines. Astin (1998) also found that neither negative attitudes nor experiences with modern Western medicine were predictors for the use of alternative medicine.

Benjamin Berman, Jacobs, and Starr (1997) reported a wide range of opinions about the safety of CAM, ranging from safe and profoundly beneficial to unscrupulous quackery. The sample was not concerned about the safety of alternative medicine. In fact, students responded most negatively to questions that suggested that CAM offered quick cures that were potentially harmful, and that CAM practitioners were quacks and frauds. The students appeared to have high regard for CAM practitioners and their services and did not feel threatened or in jeopardy when using such services. These findings are important for college health care providers, who must incorporate questions about CAM use as

**Table 3. Comparison of the Use of Alternative Medicine by UNT Sample and Other Studies**

Variables	UNT Sample %	Astin % (1998)	Eisenberg et al. % (1998)	Burg, Hatch, & Neims % (1998)	Drivdahl & Miser % (1998)
Overall usage	66	40	42	62	28
High dose vitamins/nutritional supplements	43	NA	5.5	NA	NA
Herbal medicine	42	NA	12	NA	35
Relaxation/meditation	42	7	16.3	NA	NA
Massage therapy	35	NA	11	NA	36
Chiropractic medicine	18	16	11	NA	64
Yoga	12	NA	NA	NA	NA
Acupuncture	5	NA	1 (%)	NA	16

Note: NA=not available.





part of their routine care. Respondents in this study indicated that a holistic attitude and control are important factors in their decision to use CAM. Medical providers should acknowledge that students recognize the importance of the mind and body in promoting wellness and wish to be treated holistically. Because control is also identified as an important factor, medical providers should ascertain that the care options discussed promote shared decision-making.

Consistent with Wallston and colleagues (1978) and Sweeting (1990), this study found that IHLC was a predictor for CAM use. As persons who use CAM are more likely to respond positively to programs and services that promote self-direction and control, in addition to care, it may be helpful for service providers and educators to provide reading materials and other self-study resources for students.

## CONCLUSIONS

The practice of CAM among Southwestern college students in this study was widespread compared with other studies. The use of vitamin supplements, herbal medicine, relaxation/meditation, and massage therapy were found to be the most popular CAM techniques used among students. A holistic attitude and control toward CAM was a set of strong predictors for college students' CAMU. There was a positive relationship between CAMU and possessing an IHLC.

This study confirmed that the practice of CAM was widespread among college students. As they attend to the health care needs of students, health providers could also educate students about the health potential and risks of different aspects of CAM. Campus health care professionals should provide updated information and guidelines to help students make informed health choices. This service may include asking students when they seek medical attention at the health center whether they use CAM. College health care professionals should find out more about CAM themselves so that they can provide credible information and appropriate advice to

students. Sikund and Laken (1998) reported most of the physicians (83.5%) in their study believed their patients were using CAM, and 54% of these doctors were interested in taking courses in CAM. Consistent with Eisenberg's (2002) suggestion, physicians should incorporate effective CAM into patient care, allow time to explain treatment choices to patients, and respect patient choices among therapeutic alternatives.

Because females and older students are more amenable to using CAM, health educators should work closely with other campus resources to provide education and advice to female students. They may use resources on campus to reach nontraditional and commuting female students.

Incorporating relaxation techniques, massage therapy, or yoga classes in college health centers, counseling centers, and psychology clinics would be appropriate and timely. Campus health professionals may consider incorporating CAM in some of their therapies. Campuses may consider offering courses on CAM as part of a core curriculum to all students as a measure to improve their knowledge on personal health.

CAMU is on the rise on campuses (Denur, 1997). Students may not be aware of potential risks of mixing CAM remedies and conventional medicine. It would be helpful for college health providers to conduct periodic surveys of students regarding their CAMU so as to be more effective in treating students when they appear for treatment at college health facilities.

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